

Particulate Matter NAAQS: Perspectives and Challenges – Arizona

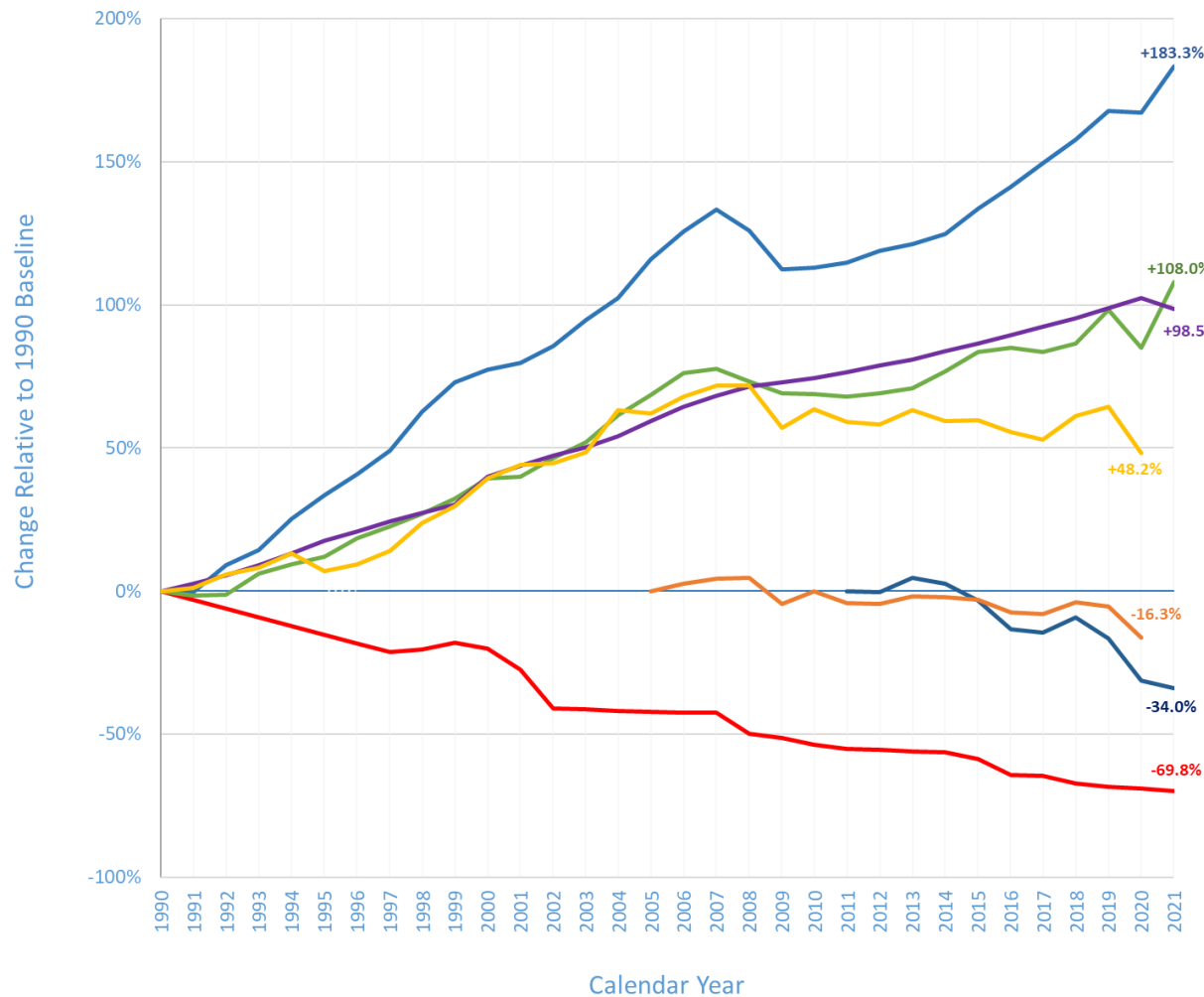
Brad Busby
Arizona Dept. of Environmental Quality
Sept. 27, 2023



Clean Air, Safe Water,
Healthy Land for Everyone



Economic and Air Quality Trends in Arizona since 1990



Inflation-adjusted GDP

U.S. Bureau of Labor Statistics,
U.S. Bureau of Economic Analysis

Highway Miles Driven

Arizona Department of Transportation

Population

U.S. Census Bureau

Fossil Fuel Energy Consumption

U.S. Energy Information Administration
2020 data not available as of last update

Total GHG Emissions

U.S. Environmental Protection Agency; National Inventory

Electricity Generation GHG Emissions

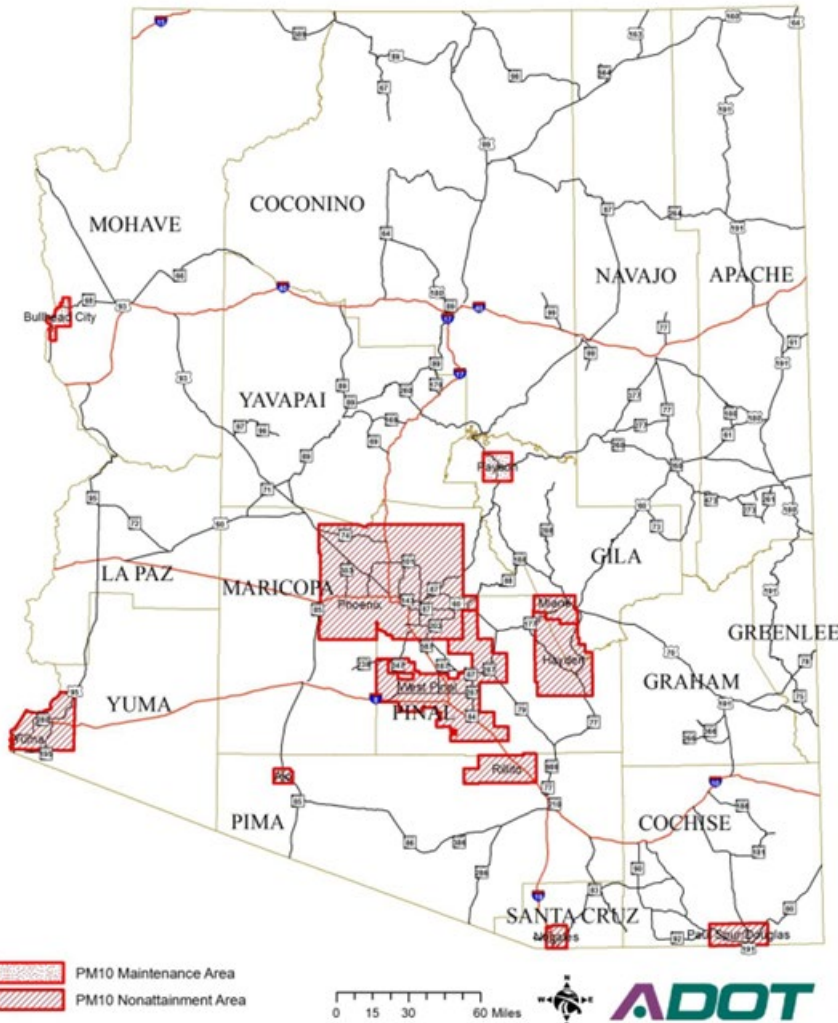
U.S. Environmental Protection Agency; Greenhouse Gas Reporting Program

Criteria Air Pollutant Emissions

U.S. Environmental Protection Agency;
Wildfires and prescribed burns excluded
1991-1995 data unavailable

PM₁₀ – Current Status in AZ

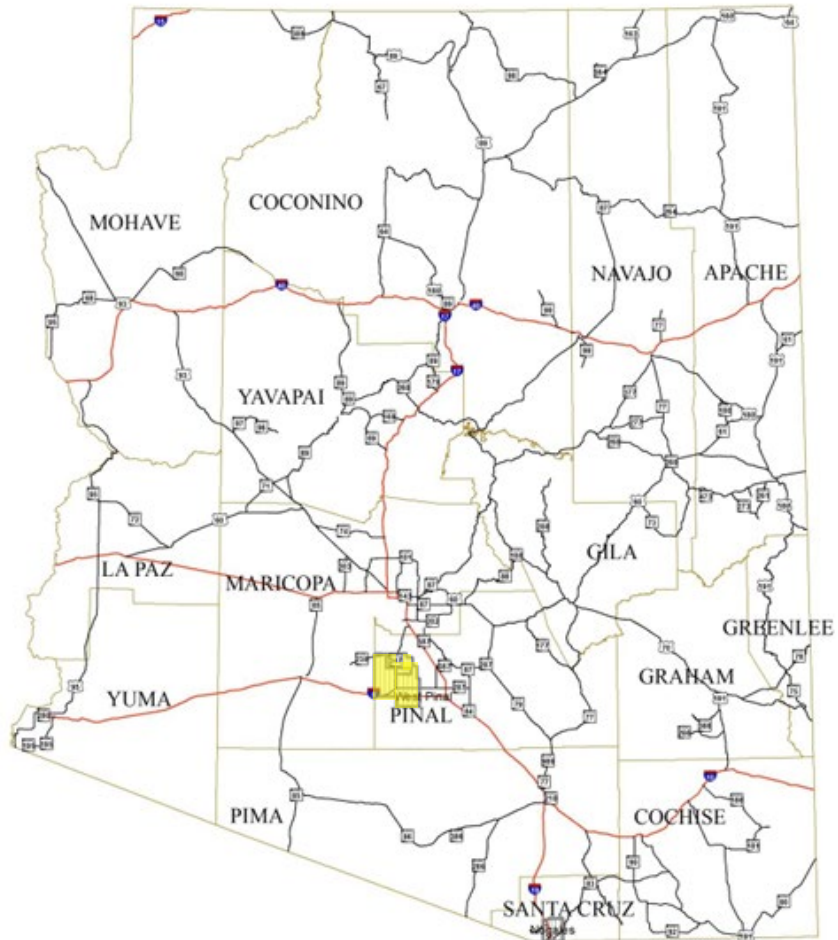
Arizona PM₁₀ Nonattainment and Maintenance Areas



Pollutant	Area	Designation	County
Particulate Matter (PM ₁₀)	Ajo (Pima County), AZ	Moderate	Pima (P)
	Hayden AZ	Moderate	Gila (P) Pinal (P)
	Miami, AZ	Moderate	Pinal (P)
	Mohave, AZ (Bullhead City)	Maintenance	Mohave (P)
	Nogales, AZ	Moderate	Santa Cruz (P)
	Paul Spur/Douglas (Cochise County), AZ	Moderate	Cochise (P)
	Phoenix-Mesa, AZ	Serious	Maricopa (P) Pinal (P)
	Payson, AZ	Maintenance	Gila (P)
	Rillito, AZ	Moderate	Pima (P)
	West Pinal, AZ	Moderate	Pinal (P)
	Yuma, AZ	Moderate	Yuma (P)

PM_{2.5} – Current Status in AZ

Arizona PM_{2.5} Nonattainment Areas

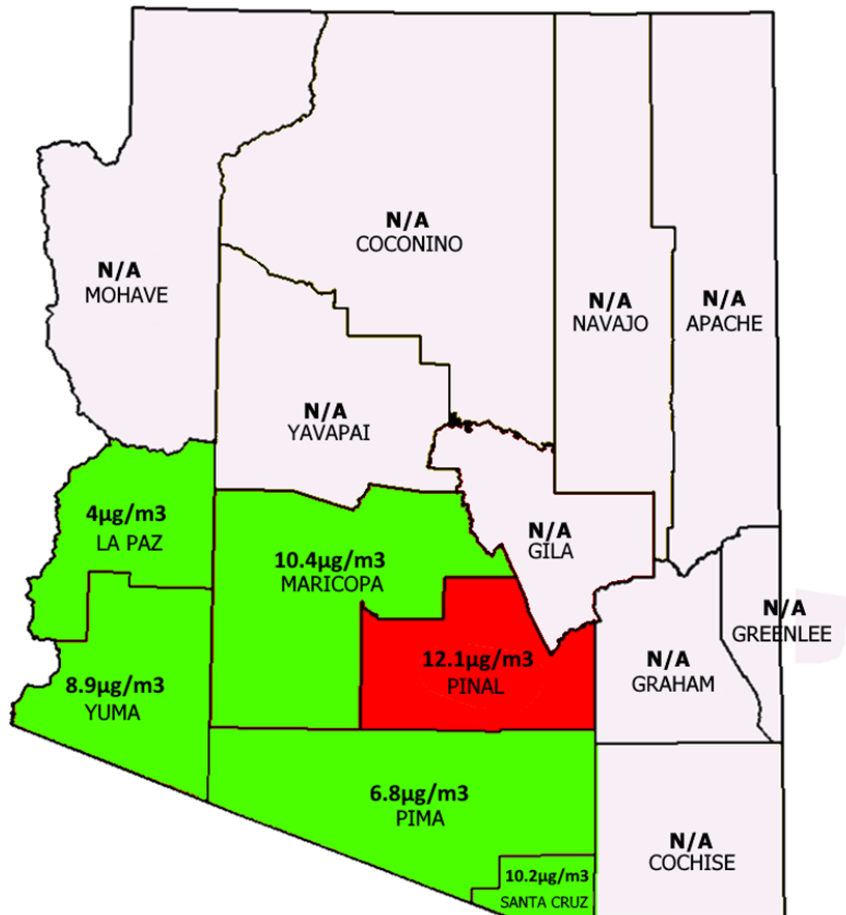


Pollutant	Area	Designation	County
2006 Particulate Matter (PM _{2.5})	West Central Pinal, AZ	Nonattainment	Pinal (P)

Potential Impact of Lower Annual PM_{2.5} NAAQS

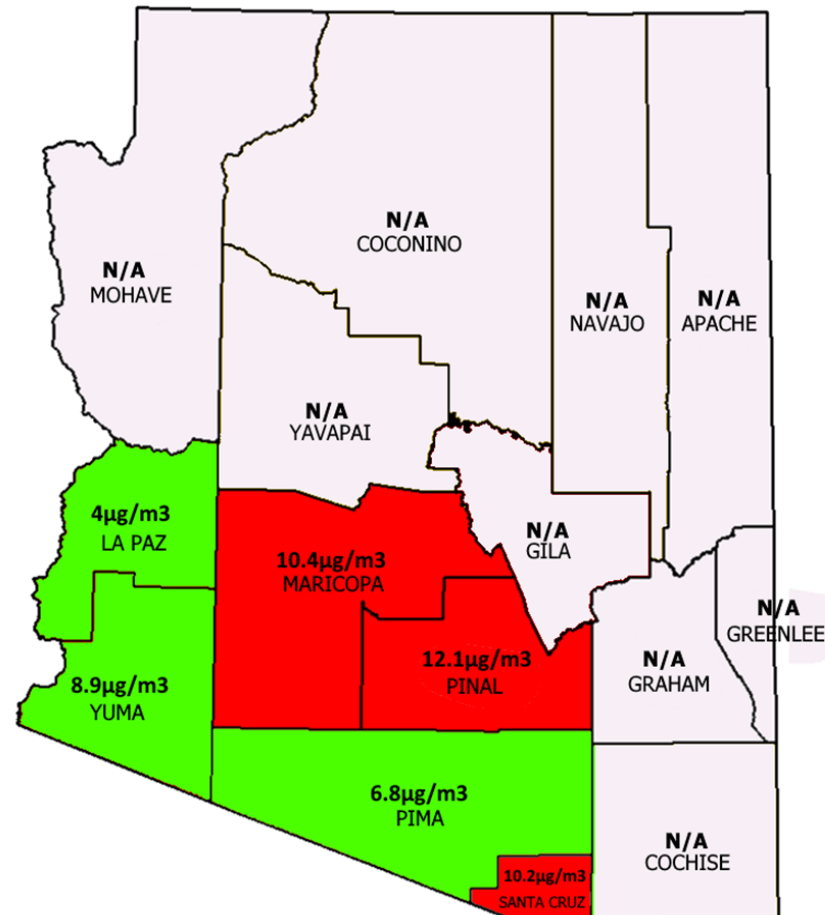
Current Standard

2022 PM_{2.5} Design Value: Annual
CURRENT STANDARD OF 12µg/m³



Potential New Standard

2022 PM_{2.5} Design Value: Annual
IF THE STANDARD WAS 10 µg/m³



Wildfire Smoke – Impacts and Concerns



Exceptional Events

- Dust Storms (PM)
- Wildfires (PM, O₃)
- Stratospheric Intrusions (O₃)
- Volcanic Eruptions (SO₂ & PM)



- ADEQ has previously submitted numerous PM₁₀ and Ozone Exceptional Event Demos to the EPA
- Concurrences were received for:
 - Windblown Dust PM₁₀ Events
 - 17 Total Exceedance events in 2011 and 2012
 - Wildfire Influenced Ozone Events
 - June 20, 2015
 - July 7, 2017
 - No Recent Event Submittals
 - Lack of regulatory significance in some areas
 - Other areas without approved SIPs or fully documented PM controls (Yuma, Rillito)

Tools: Visibility Images and Videos

South Mountain

South Mountain

July 27, 2021 7:00 PM

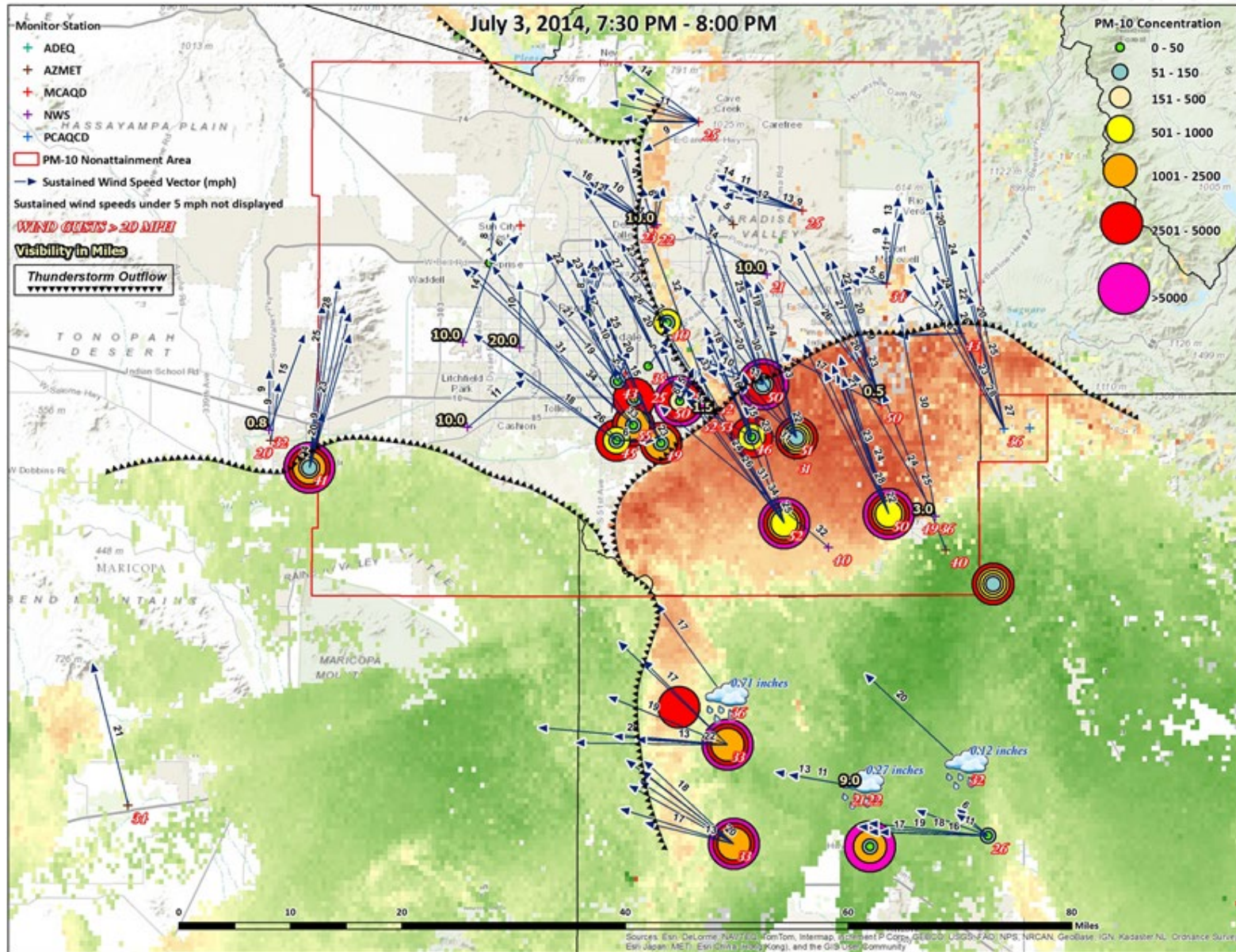
July 27, 2021 7:15 PM

July 27, 2021 7:30 PM

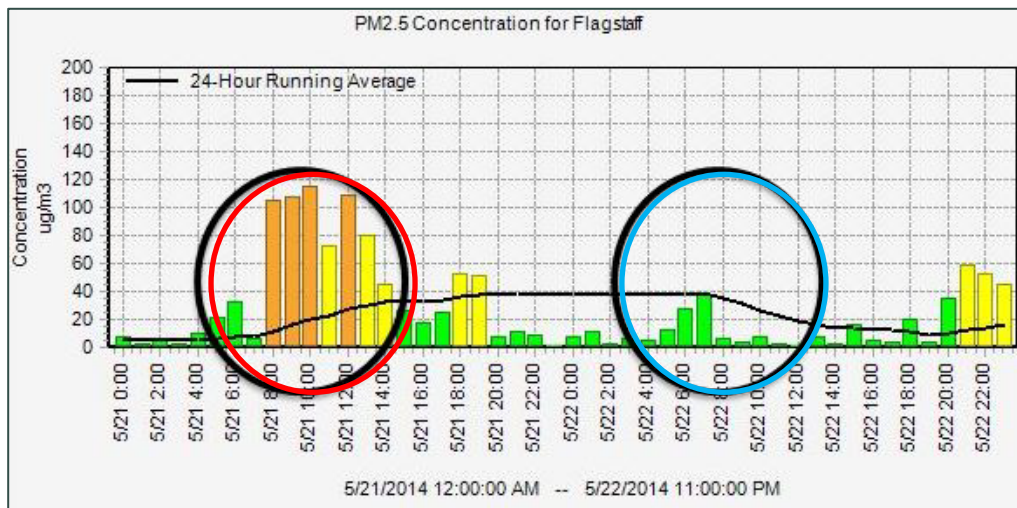
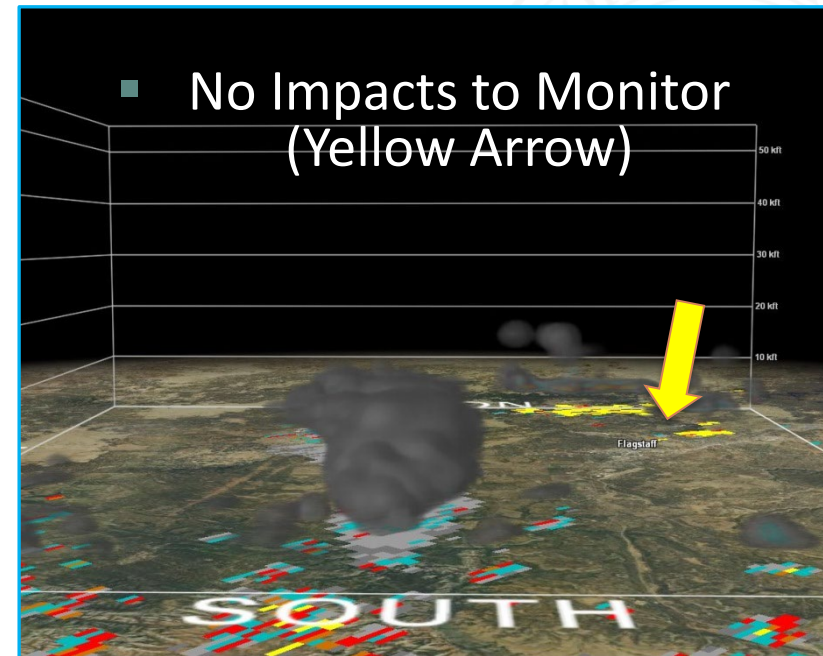
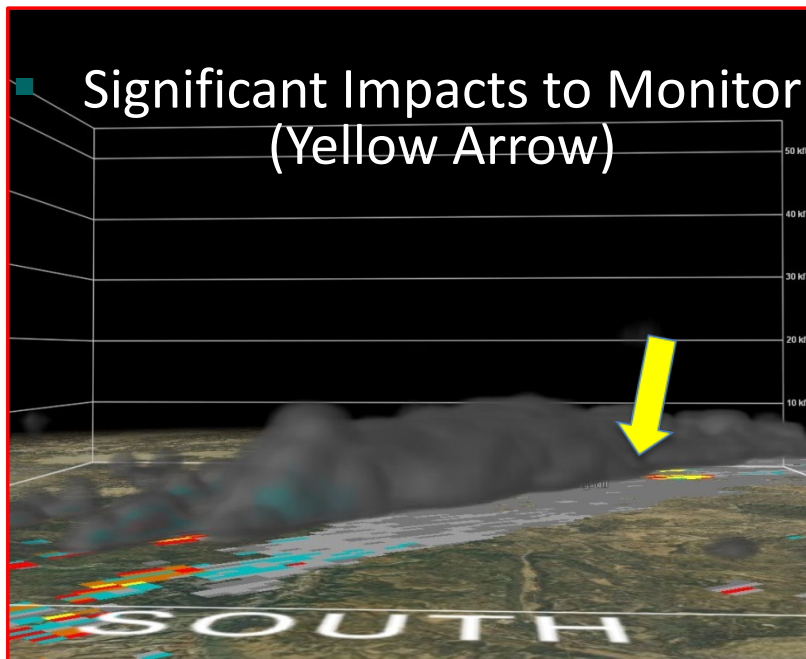
July 27, 2021 7:45 PM



Tools: GIS Imagery – Windblown Dust



Tools: Radar Smoke Detection and Analysis



- Radar may be useful for a PM_{2.5} Exceptional Event demo from more localized wildfires
- Radar may not be as useful for Wildfire O₃ EE demo due to longer range transport and Radar limitations

- ADEQ and EPA Region 9 previously **implemented 50% streamlining** in preparation time (from 2011 to 2017)
- ADEQ spent over **\$800K** to prepare **50 EE** demonstrations for 2011-2012 period
- It costs about **\$15-20K per windblown dust event** and requires on average about **150-200 hours** to research, prepare, review and submit each demonstration package
- EPA **approved** approximately 20 of 60 ADEQ demonstration packages in Maricopa County / Phoenix NAAs
- This means approximately **\$750K** and about **7,500 hours** of effort **were never acted on by EPA and “rolled off” the Design Value**
- The 2016 Exceptional Event Rule provided a clearer process that should mitigate these unacted on exceptional events going forward
- In the spirit of **Continuous Improvement**, what else can we collaboratively do to further streamline both the creation and the review of Exceptional Event demonstrations?



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